

Storm Fury on the Plains

Fall Spotter Newsletter

November 2014

Decision Support Services

By Mick McGuire – Meteorologist

Decision support services (DSS) have become more common and are provided by many National Weather Service (NWS) offices. These include special briefings and interpretations of the forecast beyond the standard forecast product suite provided by the NWS. Many incidents have a weather component that might not be obvious. These include: hazardous materials releases, wildfires, search and rescue operations, and large public gatherings at high-profile sporting or political events.

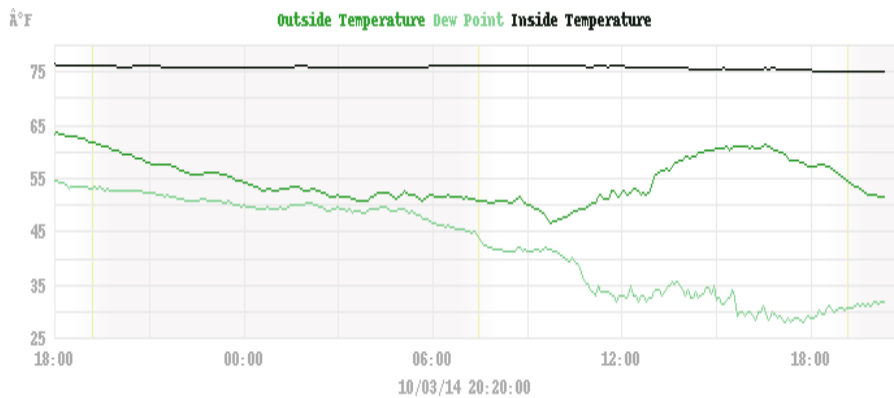
During the past spring and summer, the NWS in Wichita provided DSS to both the NCAA Men's Golf Championship in Hutchinson, KS and the Symphony on the Plains in the Flint Hills near Rosalia, KS.

Our meteorologists provided information to the decision makers for the NCAA golf tournament through coordination with emergency management when heavy rain and lightning threatened the area. This information resulted in numerous delays throughout the tournament. Meanwhile, during the Symphony on the Plains, wind and thunderstorms were the main concern; however, strong southerly winds occurred, and the information provided to the decision makers resulted in the evacuation of some of the tents.

One way to better support our customers was to provide real-time, on-site weather conditions. We now provide this with a Davis Vantage Pro II. The



**Mobile observing equipment
at NWS Wichita**



Davis Vantage Pro II weather instrument shelter is mounted on a tripod while the anemometer is mounted on a ten foot pole above the instrument package. This data is transmitted wirelessly to a console which is connected to a data logger.

*Top: Weather Temperature Graph from the Davis Vantage Pro II.
Left: Display of the Vantage Pro II*



The data logger is connected to a computer which allows us to upload the real-time weather data to a web server.

We utilize a free, open source, software program that interacts with the Davis Vantage Pro II weather station to produce graphs, reports, and HTML pages.

Wichita's Newest Meteorologist

Wichita's newest Meteorologist comes from the Dairy State. Having grown up in Wisconsin, Jaclyn had the pleasure of exper-



riencing a variety of meteorological phenomena. Her interest in the weather began as a small child on an annual family camping trip that was interrupted by a tornado.

Jaclyn attended Valparaiso University where she received her Bachelor of Science in Meteorology. After graduation, she attended the University of Wyoming where she received her Master of Science in Atmospheric Science.

Jaclyn has gained valuable experiences from living in the elements on Mount Washington in New Hampshire as a summer

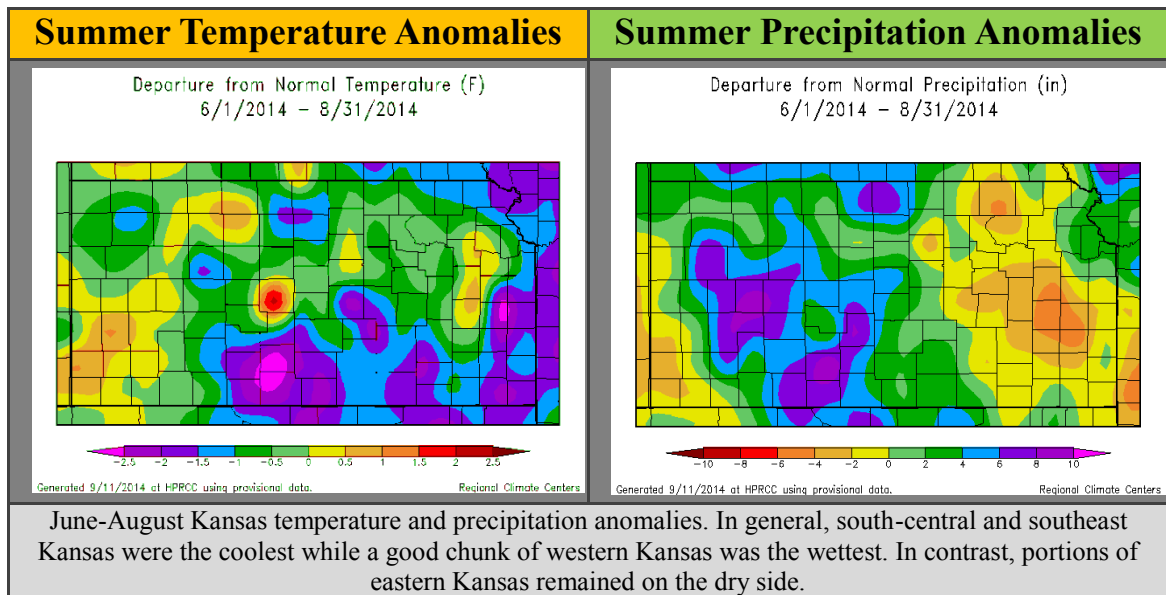
volunteer at the Mount Washington Observatory to teaching laboratory classes at the University of Wyoming. She also participated in launching weather balloons at Valparaiso University and was a part of the longest continuous ballooning program in the world at the University of Wyoming.

In her free time, Jaclyn enjoys spending time outdoors, running, playing soccer, hiking, and storm chasing. She looks forward to serving the communities across central and south-east Kansas and the forecasting challenges Kansas weather brings!

Summer 2014 Kansas Weather Highlights Relatively Wet and Cool

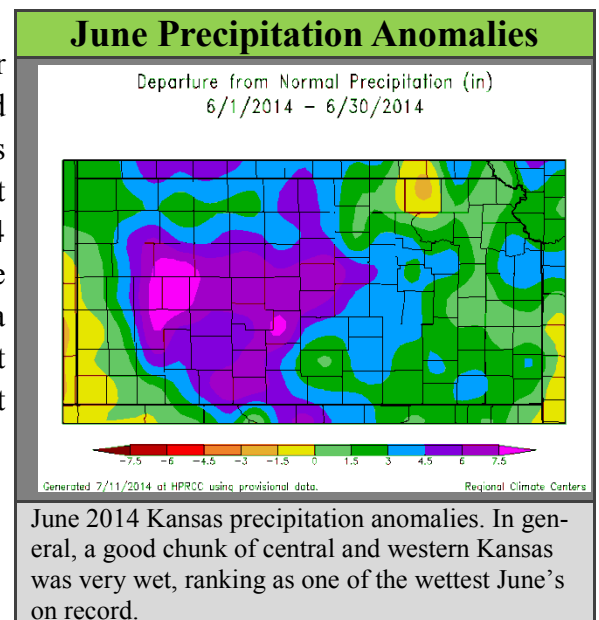
By: Andy Kleinsasser-Meteorologist

On average, summer 2014 across the Sunflower State was cooler and wetter than average, thanks in large part to a wet June and a cool July.



In June, many areas were 2 to 3 inches wetter than average with a good section of western and central Kansas at least 4 to 7 inches above normal for the month. This was due in large part to periodic rounds of heavy rain-producing thunderstorms throughout the month. Consequently, June 2014 ranked as 4th wettest June across the state since 1895 and the wettest since 1967.

In July (image on next page), much of the state was cooler than average, most notable over portions of south-central and southeast Kansas where average monthly temperatures (average of each daily high and low temperature) were at least 4 to 5 degrees cooler than average. Consequently, July 2014 ranked as 12th coolest July across the state since 1895 and the coolest since 2004. The cooler weather in July was primarily a result of stronger than normal low pressure over the Great Lakes allowing relatively chilly Canadian air to make frequent visits south across Mid-America.



Summer 2014 Kansas Temperature Highlights (Records Since 1895)

Statewide June-August	40 th Coolest	Coolest Since 2009
Statewide July	Tied 12 th Coolest	Coolest Since 2004
Southeast July	3 rd Coolest	Coolest Since 1950
South-Central July	6 th Coolest	Coolest Since 1967
East-Central July	8 th Coolest	Coolest Since 2009

In August, things evened out a bit with many areas of the state receiving near-normal precipitation although there were pockets where exceptions prevailed. Portions of eastern and southeast Kansas experienced fairly dry conditions with some areas 2 to 4 inches drier than normal for the month. In contrast, much of far northern Kansas was wetter than normal. Portions of north-central Kansas were 3 to 5 inches above normal for the month ranking as the 11th wettest August on record. In the temperature department, August was on average a bit warmer than average across the state.

Typically, cooler summer months correlate to wetter conditions and vice-versa, but this wasn't the case in June-July. Despite the very wet conditions in June, corresponding temperatures were near average which was the same in July. Despite the cool temperatures, much of the state experienced near to drier than average

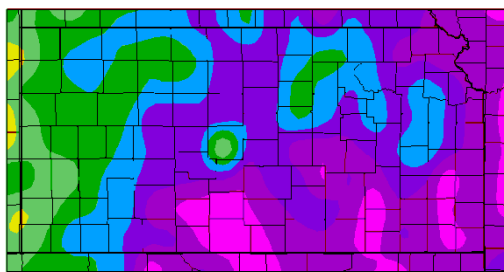
Summer 2014 Kansas Precipitation Highlights

Statewide June-August	22 nd Wettest	Wettest Since 2005
Statewide June	4 th Wettest	Wettest Since 1967
West-Central June-August	9 th Wettest	Wettest Since 1993
West-Central June	2 nd Wettest	Wettest Since 1951
Central June	3 rd Wettest	Wettest Since 1965
South-Central June	3 rd Wettest	Wettest Since 1957
Northwest August	11 th Wettest	Wettest Since 1999
North-Central August	11 th Wettest	Wettest Since 2006
East-Central July	18 th Driest	Driest Since 2012

precipitation, especially northern and eastern portions of Kansas, where some areas were 3 to 4 inches drier than average for July. However, a small portion of south-central Kansas did indeed experience a wet July with some many areas 2 to 4 inches wetter than average for the month.

July Temperature Anomalies

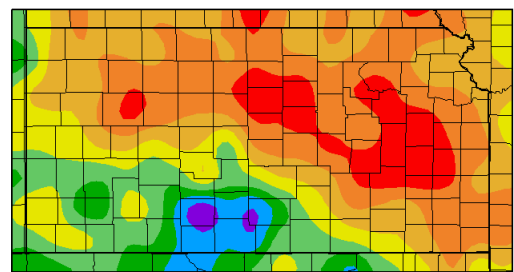
Departure from Normal Temperature (°F)
7/1/2014 – 7/31/2014



Generated 8/11/2014 at HPRCC using provisional data. Regional Climate Centers

July Precipitation Anomalies

Departure from Normal Precipitation (in)
7/1/2014 – 7/31/2014



Generated 8/11/2014 at HPRCC using provisional data. Regional Climate Centers

July 2014 Kansas temperature and precipitation anomalies. Much of the state was cooler than normal, most notably over south-central and southeast Kansas, ranking as one of the coolest Julys on record. Surprisingly with the exception of south-central and southeast Kansas, the cooler weather did not translate into wetter than normal conditions especially over northern and eastern portions.

Evapotranspiration...excuse me?

By: *Vanessa Pearce - Meteorologist*

Evapotranspiration is a noticeable process primarily to the agricultural community. This process involves evaporation and transpiration from vegetative surfaces which results in water vapor over a respective area or the transfer of water vapor to the atmosphere. Evaporation occurs when water in the plant surfaces or soil or body of water is heated and alters its physical state to the form of a gas or water vapor. If there is a greater pool of water such as a soil surface after rain or irrigation, then there will be a higher rate of evaporation. Transpiration involves the water from the plant being released through the pores on the surface of the leaf.¹ In the start of the growing season, the majority of the evapotranspiration occurs from the soil and depends on its moisture content. As the season progresses, there will a substantially greater amount of evapotranspiration coming from the crop canopy.² For example, corn is known to have one of the highest rates of evapotranspiration comparative to other crops in the High Plains.³ The higher rate of evapotranspiration can impact the dewpoint temperature or humidity in a given area which in turn can alter the heat index. Additional factors can influence evapotranspiration such as the "surface temperature, near-surface wind speed, specific humidity, and stability"⁴ based on how much moisture is found in the soil.

The amount of evapotranspiration can be calculated or measured using a device called a lysimeter. Once there has been a calculation or measurement of the rate of evapotranspiration, individuals can alter their watering schedules accordingly. Observations can be found from the Kansas Mesonet for a few spots in Kansas; however, this network is limited. Currently the National Weather Service in Wichita is exploring the idea of providing a forecast for evapotranspiration; however, the first step is trying to obtain reliable data sources of this information. Thus if there are any farmers or golf course maintenance managers who calculate such information in Kansas, we would love to hear from you.

1. Al- Kaisi, Mahdi. 2000. "Crop water use or evapotranspiration." *Integrated Crop Management News*. IC-484(11): 85-86. (<http://www.ipm.iastate.edu/ipm/icm/2000/5-29-2000/wateruse.html>)
2. Et. al.
3. Camp, C.R., E.J. Sadler, and R.E. Yoder (eds.) *Evapotranspiration and Irrigation Scheduling*, Proceedings of the International Conference, Nov. 3-6, 1996, San Antonio, TX, American Society of Agricultural Engineers, St. Joseph, MI. (http://www.cprl.ars.usda.gov/pdfs/96et_corn.pdf)
4. Arya, S. Pal. 1988. *Introduction to Micrometeorology*. San Diego, CA: Academic Press, Inc.



US National Weather Service Wichita Kansas

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Also be sure to check if your county Emergency Manager has a facebook page for your county.

El Niño: What It Is and How It Affects Kansas Winter Weather

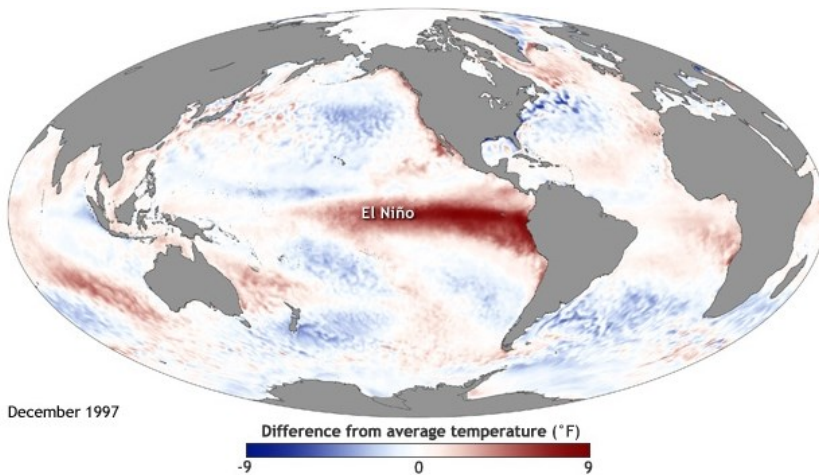
By: Andy Kleinsasser

With the prospect of El Niño developing this fall/winter, many people may be asking, “what is it, and how will it affect Kansas winter weather?” El Niño is a climate pattern recurring roughly every 3 to 7 years involving temperature changes of waters in the central and eastern tropical Pacific Ocean off the western coast of South America. The sea surface across a large swath of the tropical Pacific Ocean warms by 1°C to 3°C compared to normal. This warming directly affects rainfall distribution in the tropics and can have a strong influence on weather across the United States and other parts of the world especially during the winter and early spring months.

El Niño conditions occur when abnormally warm waters accumulate in tropical latitudes of the central and eastern Pacific Ocean. Typically, the greater the ocean warms, the stronger the El Niño. A strong El Niño can dramatically affect the strength and location of the upper level jet stream across the

While there are exceptions, in general Kansas is typically in “no-man’s land” when it comes to El Niño’s effects with the periphery of the U.S. having the greatest chance to be affected.

El Niño Ocean Temperatures



Typical ocean temperature anomalies during a strong El Niño event. Red colors indicate warmer than normal ocean waters; blue is cooler waters, and white is near normal. Notice the large tongue of relatively very warm ocean waters over the central and eastern equatorial Pacific indicative of a strong El Niño.

Pacific Ocean and North America often-times altering weather conditions. From late fall-early spring during strong to moderately-strong El Niño years, the northern and northwestern U.S. is more likely to experience warmer-than-average temperatures, and the southern U.S. is more likely to receive wet and cool conditions. In contrast, weak to moderate El Niño’s oftentimes have little if any impact on U.S. winter-spring weather, as other atmospheric patterns tend to overpower the effects of the weak-moderate El Niño.

So, what about El Niño’s effects on Kansas winter-spring weather? While there are exceptions, in general Kansas



Be sure to find

US National Weather Service Wichita Kansas

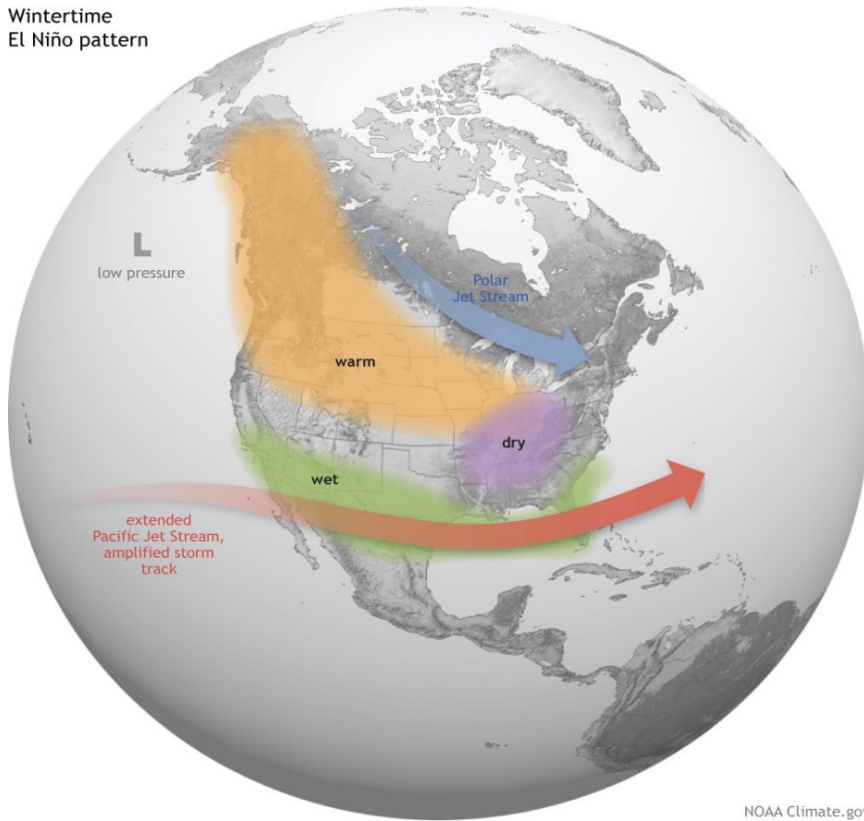
on Twitter at **@NWSWichita**

Also be sure to check if your county Emergency Manager has a Twitter account for your county.

is typically in “no-man’s land” when it comes to El Niño’s effects with the periphery of the U.S. having the greatest chance to be affected. The greatest chance El Niño has to affect Kansas weather is during a strong El Niño year when probabilities tend to favor wetter and cooler than normal conditions across far southern portions of the state with the potential for drier and warmer than normal conditions over far northern Kansas. Weak to moderate El Niño’s oftentimes have little to no impact on Kansas weather, as other atmospheric patterns tend to easily overpower the weak effects of El Niño.

A Strong El Niño Event: Winter--Early Spring Effects

Wintertime
El Niño pattern



According to the Climate Prediction Center, there is a 65% chance of an El Niño arriving this fall and persisting into early to mid-2015. However, it is expected to only be a weak to moderate event at best. Consequently, the probability of Kansas weather being affected is low.

Typical late winter through early spring weather effects of a strong El Niño. On average, the north half of the U.S. experiences warmer than normal conditions, due to a northward shift of the polar jet stream. In contrast, the southern U.S. is often cooler and wetter than average due to an amplified and strengthened Pacific jet stream. Kansas is typically somewhere in the middle; far northern Kansas may experience warmer conditions, and far southern Kansas may have wetter conditions.



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NWS Wichita

on YouTube



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“The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information, database and infrastructure which can be used by other government agencies, the private sector, the public, and the global community.”



Online: www.weather.gov/Wichita

Getting ready for winter...

Unscramble each of the clue words. Take the letters that appear in boxes and unscramble them for the final message.

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NWS Wichita Word Scramble

Answer Below:

WINTERS	WEATHER
LESHOV	SHOVEL
NETIMST	MINTENS
TIEMW	WHITTE
KAOIWBENS	SNOVFLAKE
ZOERNFN	FRÖZEN
TOSRF	FRÖST
LOCH	COLD
NDBIILWLC	WINDCHILL
TOENWIC PCA	STOCKING
RIFFT	DRIFFT
RIENZFC NAIK	FREEZING
ELSET	SLIGHT
SRSFAC	SCARF
CIE	ICE
WOSN	SNOW
BIZRLAZ	BLIZZARD